

OPERATING INSTRUCTIONS
DTC503/503-N/203/303



SPECIFICATIONS
SENSOR

Table with 3 columns: Sensor type, Temperature range (°C), Resolution (°C). Rows include J (Fe/K), K (Cr/Al), and RTD (PT100).

DISPLAY: Type: 7 segment LED; Height: 0.5" Digits: 3

CONTROL ACTION

Table with 4 columns: S.No., Control, Setting, Resolution 1°. Rows 1 and 2 describe Proportional ON/OFF control settings.

ACCURACY

SET POINT LIMIT
SETTING

RELAY ACTION

MANUAL RESET

SENSOR BREAK

TC REVERSE

OUTPUT

POWER

OPERATING TEMP.

HOUSING

HUMIDITY

WEIGHT (gms)

OVERALL DIMENSIONS (All dimensions in mm)

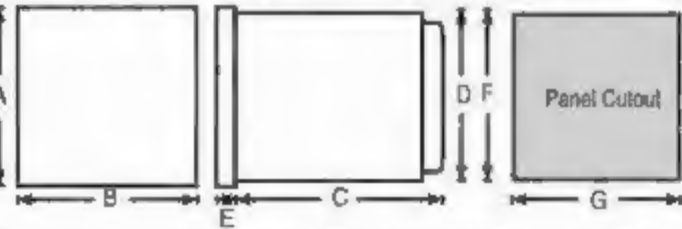


Table with 8 columns: DIM, A, B, C, D, E, F, G. Rows list models DTC503/503-N, DTC203, and DTC303/DTC303NX with their respective dimensions.

SAFETY SUMMARY

This manual is meant for the personnel involved in wiring, installation, operation, and routine maintenance of the equipment. All safety related codifications; symbols and instructions that appear in this operating manual or on the equipment must be strictly followed to ensure the safety of the operating personnel as well as the instrument.

If the equipment is not handled in a manner specified by the manufacturer it might impair the protection provided by the equipment.

CAUTION: Read complete instructions prior to installation and operation of the unit.

CAUTION: Risk of electric shock.

INSTALLATION INSTRUCTIONS

CAUTION:

- 1. This equipment, being built-in-type, normally becomes a part of main control panel and in such case the terminals do not remain accessible to the end user after installation and internal wiring.
- 2. Conductors must not come in contact with the internal circuitry of the equipment or else it may lead to a safety hazard that may in turn endanger life or cause electrical shock to the operator.
- 3. Circuit breaker or mains switch must be installed between power source and supply terminals to facilitate power 'ON' or 'OFF' function. However this switch or breaker must be installed in a convenient position normally accessible to an operator.

CAUTION:

- 1. The equipment shall not be installed in environmental conditions other than those specified in this manual.
- 2. Fuse Protection- The equipment does not contain built-in fuse. Installation of external fuse for electrical circuitry is highly recommended. Recommended rating of such fuse shall be 275VAC/1A.
- 3. Since this is a built-in-type equipment (finds place in main control panel), its output terminals get connected to host equipment. Such equipment shall also comply with basic EMI/EMC and safety requirements like BS EN 61326-1 and BS EN 61010 respectively.
- 4. Thermal dissipation of equipment is met through ventilation holes provided on chassis of equipment. Such ventilation holes shall not be obstructed else it can lead to a safety hazard.
- 5. The output terminals shall be strictly loaded to the manufacturer specified values/range.

INSTALLATION GUIDELINES

Mechanical Installation:

For installing the controller

- 1. Prepare the panel cutout with proper dimensions as shown in OVERALL DIMENSIONS
- 2. Remove the clamp from the controller.
- 3. Push the controller into the panel cutout. Secure the controller in its place by pushing the clamp on the rear side. The screws, of the pane in the clamp, must be in the foremost forward slot.
- 4. For proper sealing, tighten the screws evenly with required torque.

CAUTION:

The equipment in its installed state must not come in close proximity to any heating sources, caustic vapors, oils, steam, or other unwanted process by-products.

EMC Guidelines:

- 1. Use proper input power cables with shortest connections and twisted type.
- 2. Layout of connecting cables shall be away from any internal EMI source.

WIRING INSTRUCTIONS

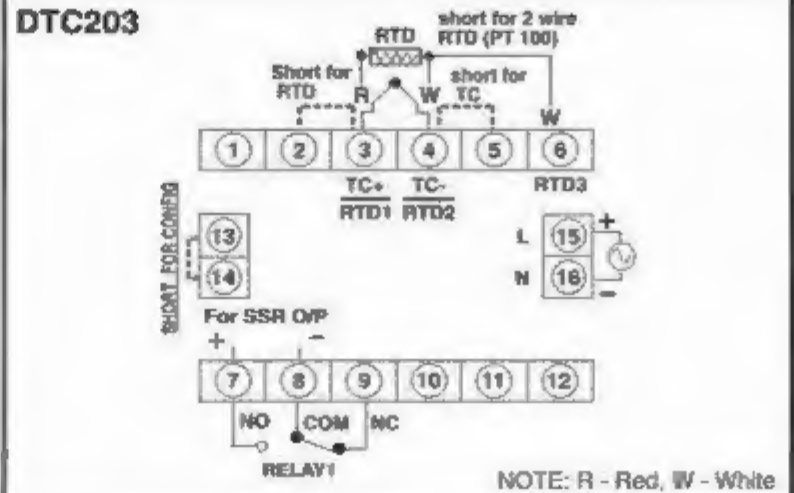
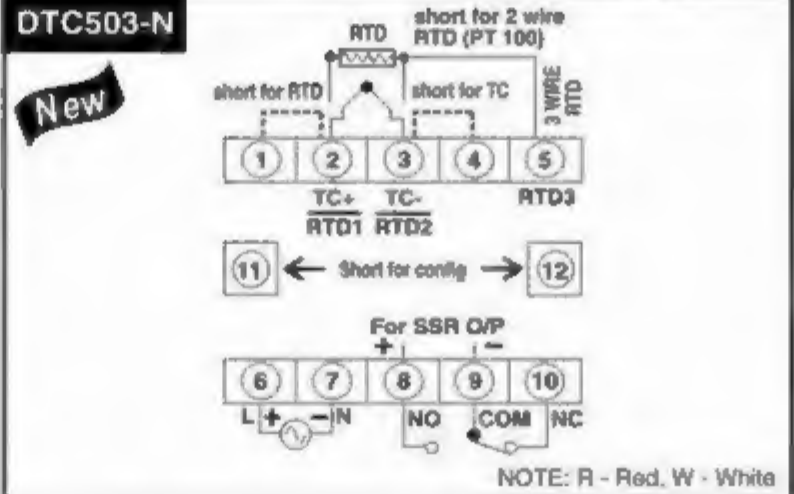
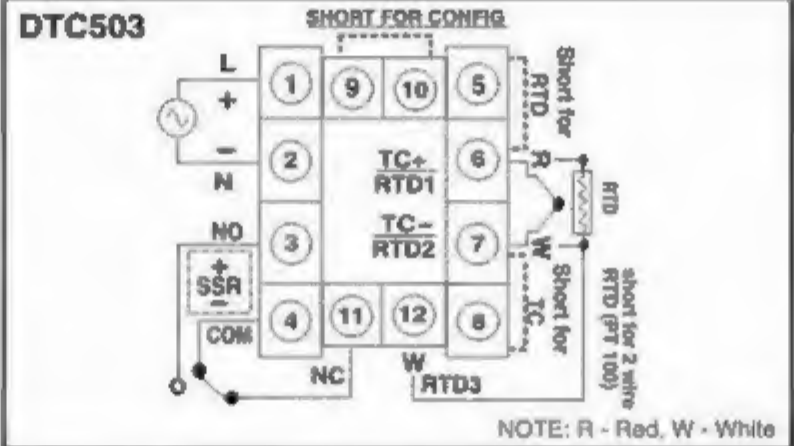
CAUTION:

- 1. To prevent the risk of electric shock power supply to the equipment must be kept OFF while doing the wiring arrangement.
- 2. Terminals and electrically charged parts Should not be touched when the power is ON.
- 3. Wiring shall be done strictly according to the terminal layout with shortest connections. Confirm that all connections are correct.
- 4. Use lugged terminals to meet M3 screws.
- 5. To eliminate electromagnetic interference use of short wire with adequate ratings and twists of the same in equal size shall be made.
- 6. Cable used for connection to power source, must have a cross section of 1 or greater. These wires shall have insulation capacity made of at least 1.5KV.

MAINTENANCE

- 1. The equipment should be cleaned regularly to avoid blockage of ventilating parts.
- 2. Clean the equipment with a clean soft cloth. Do not use Isopropyl alcohol or any other cleaning agent.

TERMINAL CONNECTIONS



DTC303 / DTC303 - NX

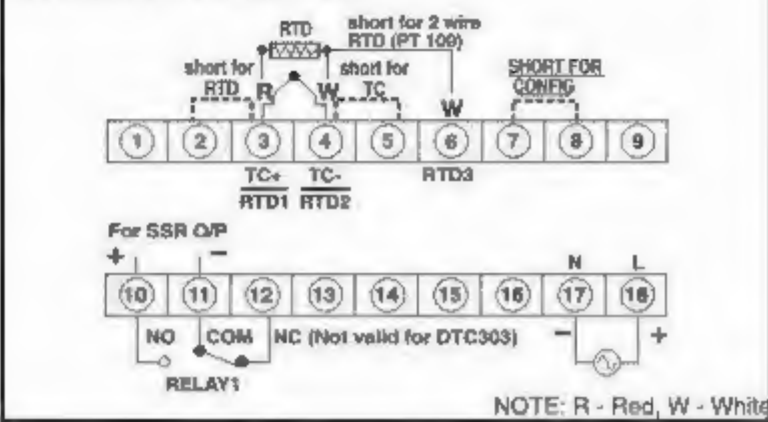
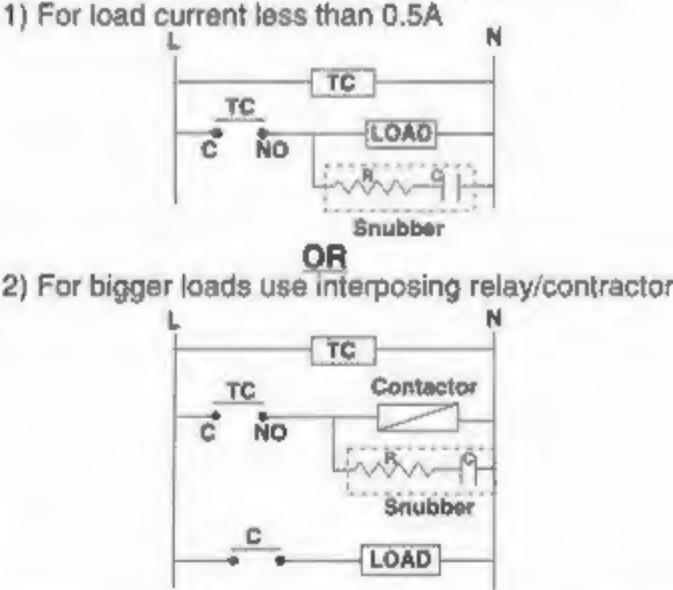


Table with 6 columns: MODELS, DTC503, DTC503-N, DTC203, DTC303, DTC303 NX. Rows list terminal descriptions and their corresponding terminal numbers for each model.

TYPICAL CONNECTIONS FOR LOADS :



NOTE: Use snubber as shown above to increase life of internal relay of temperature controller.

ELECTRICAL PRECAUTIONS DURING USE

Electrical noise generated by switching of inductive loads and can create momentary disruption, erratic display, latch up, data loss or permanent damage to the instrument. Hence to reduce to noise:

- a) Use MOV across supply of temperature controller & snubber circuits across loads are recommended
- b) Use separate shielded wires for inputs.

CONFIGURATION SCHEME (parameter setting)

1) Before configuration: Short terminals marked **SHORT FOR CONFIG**

2) Turn power ON

3) Program configuration setting as per instructions below.

Key press	Display	Description
1. To select sensor type. Factory setting: J		
(Display INP for 1 second)		
SENSOR TYPE	J	J (-99 to 750°C)
Press □+▲	K	K (-99 to 999°C)
Press □+▲	PT100	PT100 (-99 to 850°C)
2. Press ▲ to select control mode Factory setting: On/Off		
(Display CNT for 1 second)		
CONTROL MODE	ON	ON / OFF mode
Press □+▲	PR	Proportional mode
3. Press ▲ to select proportional band or hysteresis value Factory setting: 1°C for on/off, 10°C for Prop		
(Display HY in ON/ OFF mode or Pb in proportional mode for 1 second)		
Press □+▲/▼ to change value	01	hysteresis value or proportional band
4. Press ▲ to select Cycle time Factory setting: 20 sec		
(Display CYC for 1 second)		
Valid for proportional mode only		
Press □+▲/▼ to change value	20	
5. Press ▲ to select Relay output mode Factory setting: forward		
(Display FLY for 1 second)		
RELAY OUTPUT	HE	Forward (heating)
Press □+▲	CL	Reverse (cooling)
Key press	Display	Description
6. Press ▲ to select Maximum set point limit Factory setting: For J sensor: 400°C, For K sensor: 400°C, For PT100 sensor: 400°C		
(Display HI for 1 second)		
Press □+▲/▼ to change value	400	Maximum Set point Limit

7. Press ▲ to select Manual reset (offset adjustment) lock Factory setting: Enable

New feature - Ver 1.1 onwards

(Display **LCF** for 1 second)

MANUEL RESET (OFFSET ADJUSTMENT) LOCK

Press **□+▲/▼** to change value **EN** Enable Lock

Press **□+▲/▼** to change value **DS** Disable Lock

8. Press ▲ to select reset all mode

At reset all: all parameters set to Factory setting value

Note: Reset all function to be used prior to changing input (to realign related parameters)

(Display **RSE** for 1 second)

RESET ALL **0** No reset

Press **□+▲** **1** No reset

Press **□+▲** **2** No reset

Press **□+▲** **3** No reset

Press **□+▲** **4** No reset

Press **□+▲** **5** Reset all

By pressing **▲** key it goes to sensor input menu

After configuration setting:

1) Turn power OFF

2) Remove link between terminals marked **SHORT FOR CONFIG**.

3) Turn power on

Programming Set Point

A) To view set point : Press **□** key

B) To increase / decrease set point : Press **□+▲/▼**

Continuous operation of above makes update speed faster in 3 stages after 7 seconds.

⚡ If terminals marked **SHORT FOR CONFIG** are shorted at power on, temperature controller will go in to the configuration mode. To quit configuration setting mode, turn power off, remove link between terminals marked **SHORT FOR CONFIG** & switch power on.

Programming Manual (offset adjustment) reset

NOTE: This selection is valid only if parameter 7 is configured as Disable

CAUTION: Ensure terminals marked **SHORT FOR CONFIG** are open. To program Manual offset : Press **▲+▼** keys together for 3 seconds.

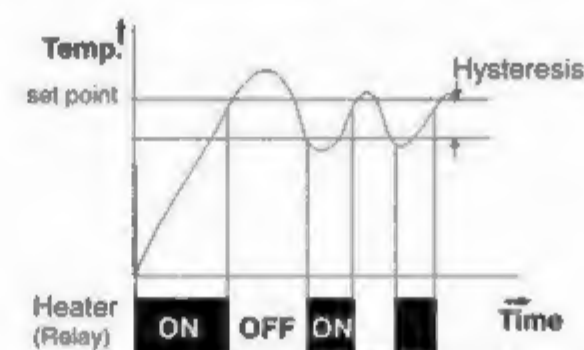
Manual (offset adjustment) reset Factory setting: 00

Key press	Display	Description
(Display OFF for 1 second)		
Press □+▲/▼ to change value	00	Manual reset
To quit programming: Press ▲+▼ keys together for 3 seconds		

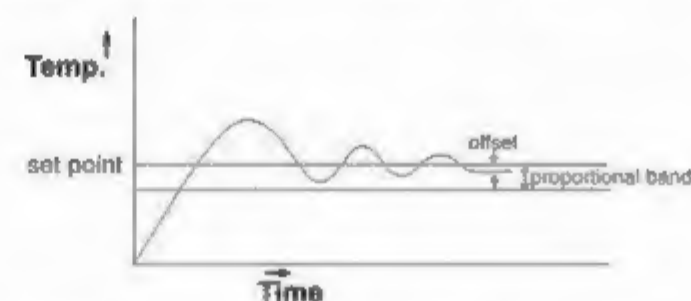
USER GUIDE :

1) ON/OFF control action (for heating) : The relay is 'ON' up to the set temperature and cuts 'OFF' above the set temperature. As the temperature of the system drops, the relay is switched 'ON' at a temperature slightly lower than the set point.

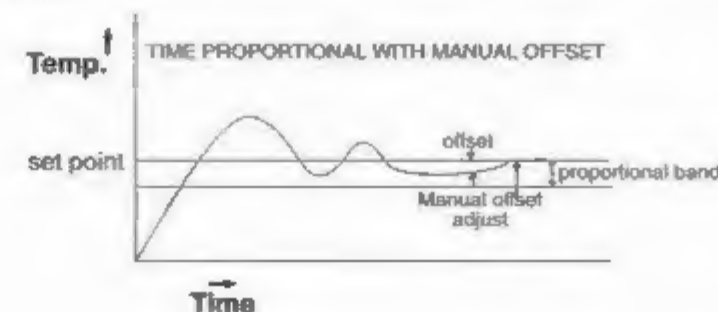
Hysteresis: The difference between the temperature at which relay switches 'ON' and at which relay switches 'OFF' is the hysteresis or dead band



2) Time proportional control: In Proportional control, the relay 'ON' time and relay 'OFF' time varies in proportion to the deviation of the actual temperature from the set value. The proportional action occurs within a band below the set point. The proportional mode of control gives closer control than ON/OFF type.



3) Offset adjustment (manual reset): After some time the process temperature settles at some point and there is a difference between the set temperature & the controlled temperature. This difference can be removed by setting the manual reset value equal & opposite to the offset.



CALIBRATION CERTIFICATE

Date:

Model No.:

Sr. No.:

Claimed Accuracy: $\pm 0.25\%$ of full scale ± 1 digit (After 20min warmup time)

Sources calibrated against:

Hinditron Multimeter, Model 86, Sr.No.:1094

Multimeter calibration report no:

ERTL (W), Mumbai, INDIA

The calibration of this unit has been verified at the following values:

SENSOR	CALIBRATION TEMPERATURE (°C)	DISPLAY VALUE (°C)
J	35	35
	300	300
	600	600
K	35	35
	500	500
	990	990
RTD (PT100)	0	0
	300	300
	557	557

The thermocouple / RTD curves are linearised in this microprocessor based product; and hence the values interpolated between the readings shown above are also equally accurate; at every point in the curve.

Unit is accepted as accuracy is within the specified limit of claimed accuracy and certificate is valid up to one year from the date of issue

CHECKED BY:

(Specifications subject to change as development is a continuous process).

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